Society of Production Engineering

SPMS 2018

37. Savetovanje Proizvodnog mašinstva Srbije

ICPE-S 2018

37th International Conference on Production Engineering of Serbia

Faculty of Engineering University of Kragujevac

Kragujevac, Serbia, 25 – 26. October 2018

FORMS OF THE REPORTS FROM THE TESTING OF WELDED JOINTS (STRUCTURES)

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Abstract: *Principle forms of test reports from testing welded structures/joints are listed in international and national standards. They mostly do not contain all the parameters identified by the process. In professional literature there are shape of forms in which is covered in more detail, the structure of the determined properties of the tested material. In this paper are listed the shapes of 12 forms developed for the needs of Faculty of Mechanical and Civil Engineering in Kraljevo, with a short description of the 10 test methods for which they are intended.*

Key words: *testing of welded joints, destructive and non-destructive testing, contact and contactless testing, surface and depth anomalies in the material, test report, report forms.*

1. PENETRANT TESTING

Penetrant testing is used to identify faults that are open on the surface of the material. It is most commonly used for metal testing, but also for testing non-metallic materials or ceramics[6].

The penetrant application procedure consists of five operations: cleaning the examined surface, penetrant application, removing excess penetrant, application developers, reading and interpretation.

The final part of the examination[7], respectively "reading and interpretation", is the most important operation to form a test report, form 1 [4,7]. Determined indicators do not allow the recognition of the dimensions and shape of the error in the direction of the depth (interior of the tested material).

2. VORTEX CURRENT TESTING (FOOK CURRENTS)

Tests based on the application of electromagnetic waves belong to a group of non-destructive and non-contact methods. They are based on the application of electrical and magnetic phenomena, and enable recognition of surface and sub-surface errors in electroconductive materials[2]; Vortex current testing (Fook currents), magnetic particle testing and magnetic-flux testing (without the use of magnetic particles).

In the windings of the coil through which the alternating current flows, its formed own variable magnetic field, which has the same frequency as well as the current that produced it. By introducing an electro conductive material into the formed variable magnetic

field there is an induction of a variable current the opposite direction from the base - wind turbine or Fook current.

In addition to data contained in form 2[4,7] of the report, they should be added:

- probe type and applied frequency,
- covered area; 180^0 or 360^0,
- calibration report.

3. TESTS USING MAGNETIC PARTICLES

Materials that are easily magnetized are examined (ferromagnetic) [6,4]. Errors that come to the surface are recognized (open) or are in its immediate vicinity, but the sensitivity of the method decreases with increasing depth at which they are located.

The method is based on the application of magnetic material in the form of dry splinters, contained in suspensions or in spray bottles. It does not allow high accuracy and reliability of the results, but it's fast, inexpensive and easy to implement. The specificity of the procedure is reflected in the elements which are entered in form 3[4,7] of the report.

4. MAGNETIC FLUX TESTING

Magnetic field testing is a non-destructive procedure which is used to identify errors caused by corrosion or pitting, mainly on pipelines or stable tanks [6]. The tested ferromagnetic material is magnetized, and the density of the induced magnetic flux is recognized by the change in the voltage induced in the winding coils or using Hal's sensors. With increasing intensity of magnetization, the depth of sensitivity of the method increases i.e. the depth at which errors in the material are recognized. The test report shows the results achieved, form 4 [4,7].

5. IONIZING RADIATION TESTS

Tests on ionizing radiation of materials include methods based on the irradiation method, without destroying the tested material, using H, or γ-radiation and a suitable identification material[6].

Quality indicator material (IKS) is equal or less absorption of power from the test material. The radiographs produced are permanently stored, and modern computer capabilities are such that radiograms can be entered in a specially arranged document or to be a supplement to the test report (form 5[4,7]).

6. ULTRASOUND TESTING

Ultrasound has a frequency above the upper limit of sensitivity for normal human ear (20 kHz). In industrial conditions it is used in test procedures (controls) as a contact technique without destruction of the tested material.

When devices are not used during testing for recording the test results, it is appropriate to apply the form 6 [4,7].

7. STATIC TESTS FOR AXIAL FORCES

Here are applied forces whose direction coincides with the axis of test tube; on straining and pressure.

By testing the welded joint on straining are determined tensile strength of welded joints as a whole and tensile strength of metal seam (properties of resistance). Percentage elongation after break (disruption percentage elongation) and percentage constriction of cross section (disruption of cross section) they represent the properties of resistance[6,5].

Since pressure testing is mainly used for testing of brittle materials and rarely plastic ones, it is rarely used for testing welded joints.

Test report, form 7[4,7,3], should include information that fully displays the results achieved and allow repeatability of the test.

8. EXAMINATION OF CONSUMED ENERGY OF IMPACT OR IMPACT TOUGHNESS

The energy used to break the test tube during a single impact is determined. If consumed energy is reduced to the surface of the cross-section, the value of impact

toughness is obtained. Otherwise the energy consumed for the fracture is expressed[6].

The device for impact test or Sharp's device provides the necessary initial potential energy which, by releasing the pendulum, turns into kinetic and at the moment of the impact in the tube in the fracture energy.

In the test report, form 8 [4,7], the appearance of the breaking surface should be entered/described.

9. BENDING TEST

The testing determines the technological ability of steel to deform with bending. Also applies to welded constructions/joints by checking whether it can be reached the required/set value of the bending angle and by determining the bending angle until the first crack occurs [6].

The report, form 9[4,7], contains most of the elements that can be expressed on the basis of the bending test.

10. STATIC METHODS OF HARDNESS TESTING

Examination of welded joints is carried out with the aim of determining the hardness of metal seams, HAZ and basic material.

The hardness determined by Brinell's method represents the coefficient of the pressing force F and the surface S, which is generated by the impeller on the surface of the test material. The dimensions of diameters prints are measured, or otherwise determined. The report, form 10 [4,7], includes all the necessary data for the complete presentation of the results of the examinations.

Hardness by Vickers represents the coefficient of the pressing force F and the surface S, which is based on the surface of the test material. The size and shape of the print are different in relation to the imprint of the ball at Brinell's method. Measures are the length of the diagonal square shape of the print. The report, form 11 [4,7,1], contains the necessary data for a complete presentation of the results of the examination.

The hardness of the Rockwell method represents the irreversible depth of the impression made by the imprinting surface of the test material. The specified definition applies for both types of impellers, ball B and cone C, but they differ in applied scale [1]. The report, form 12 [4,7], contains the necessary data for a complete presentation of the results of the examination.

At Vickers and Rockwell methods, the obtained test results obtained on curved surfaces are corrected.

Classical dynamic methods of hardness testing are rarely used. However, when it does, the forms of static methods (form number 10, for example), are used, and portable devices have separate forms of reports that are received in electronic or printed form immediately after the end of the examination.

11. INTERPRETATION OF RESULTS – CONCLUSION

The authors don't consider that these patterns are comprehensive. Such goal isn't unrealistic, but the question is how real and necessary it is to industrial practice. It is expected that the existence of the presented forms is used to create a solution that needs to meet current needs and in that sense can serve as a useful basis.

In aesthetic sense, they also represent a slightly more free approach, and this is a possible contribution to the creation of even more prominent documents. Their appearance can be understood as a kind of critique of existing and of the standards presented of non-formal and formal solutions.

LITERATURE

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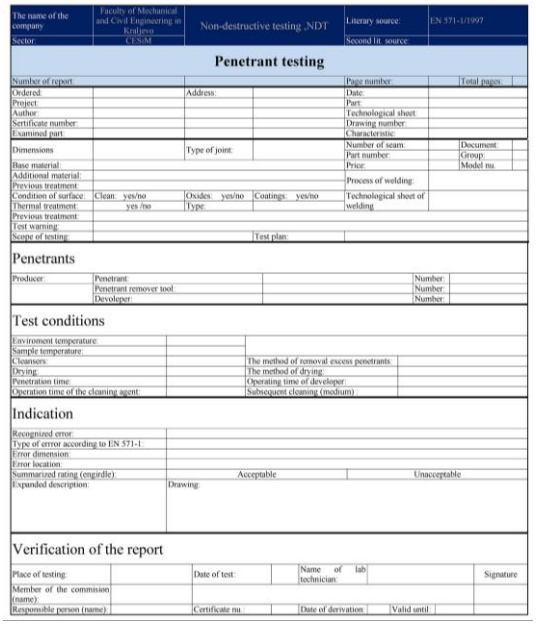


The name of the company:	Faculty of Mechanical and Civil Engineering in Kraljevo	Non-destructive testing ;NDT	Literary source:	EN 571-1/1997
Sector:	CESiM		Second lit. source:	

Penetrant testing

Number of report:			Page number:	Total pages:
Ordered:		Address:	Date:	
Project:			Part:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	
Dimensions		Type of joint:	Number of seam:	Document:
			Part number:	Group:
Base material:			Price:	Model nu.
Additional material:			Process of welding:	
Previous treatment:				
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding
Thermal treatment:	yes /no	Type:		
Previous treatment:				
Test warning:				
Scope of testing:		Test plan:		

Penetrants

Producer:	Penetrant:		Number:
	Penetrant remover tool:		Number:
	Devoleper:		Number:

Test conditions

Enviroment temperature:			
Sample temperature:			
Cleaners:		The method of removal excess penetrants:	
Drying:		The method of drying:	
Penetration time:		Operating time of developer:	
Operation time of the cleaning agent:		Subsequent cleaning (medium):	

Indication

Recognized error:			
Type of error according to EN 571-1:			
Error dimension:			
Error location:			
Summarized rating (engirdle):	Acceptable		Unacceptable
Expanded description:	Drawing:		

Verification of the report

Place of testing:		Date of test:		Name of lab technician:		Signature
Member of the commision (name):						
Responsible person (name):		Certificate nu.		Date of derivation:	Valid until:	

Form 1. Penetrant testing report.

The name of the company:	Faculty of Mechanical and Civil Engineering in Kraljevo	Non-destructive testing NDT	Literary source:	
Sector:	CESiM		Second lit. source:	

Vortex current testing (Fooks)

Number of report:			Page number:	Total pages:
Orderer:		Address:	Date:	
Project:			Part:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	
Dimensions:		Type of joint:	Seam number:	Document:
			Part number:	Group:
Base material:			Price:	Model nu.
Additional material:			Process of welding:	
Previous treatment:				
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding:
Thermal treatment:	yes /no	Type:		
Previous treatment:				
Warning about the test:				
Volume of testing:		Plan of testing:		

Sound (sensor)

Manufacturer:	Type of sound (sensor):		
	Frequency:		
	Calibraton performed (round):	yes	no
	Included area (round):	180°	360°

Test conditions

Temperature of environment:	
Temperature of sample:	
Surface cleaner:	
Way of drying:	
Afterward cleaning (medium):	

Indicaton

Recognized error:		
Type of error:		
Dimensions of error:		
Location of error:		
Summarize evaluation (round):	Acceptable	Unacceptable

Description and location of indications

Verification of report

Place of testing:		Date of testing:		Name of the laborant:		Signature
Member of the commission(name):						
Responsible person (name):		Sertificate number:		Date of receipt:	Valid until:	

Form 2. Test report from testing by the method of vortex current (Fooks).

The name of the company:	Faculty of Mechanical and Civil Engineering	Non-destructive testing NDT	Literary source:	
Sektor:	CESiM		Second lit. source:	

Testing by the method of magnetic particles

Number of report:			Page number:	Total pages:
Orderer:		Adress:	Date:	
Project:			Part:	
Author:			Techological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	
Dimensions:		Type of joint:	Seam number :	Document:
			Part number:	Group:
Base material:			Cena:	Model nu.
Additional material:			Process of welding:	
Previous treatment:				
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding:
Thermal treatment:	da /ne	Vrsta:		
Warning about thet test:				
Volume of testing:		Plan of testing:		

Magnetic material

Manufacturer:	Magnetic particles material:			
	Size of particles:			
	Way of applying magnetic material:			
	Magnetic material operating time:			
	Suspension in (round):	Spray	Water	Petroleum

Test coniditons

Temperature of environment:		Applied current:	AC/DC
Temperature of sample:		Current intensity:	
Surface cleaner		Duraton of magnetization:	
Way of drying:		Material for preservation:	
Typ of instrument for magnetization:		Afterwards cleaning (medium):	

Indication

Recognized error:		
Typ of error:		
Dimension of error:		
Location of error:		
Summarize evaluation (round):	Acceptable	Unacceptable

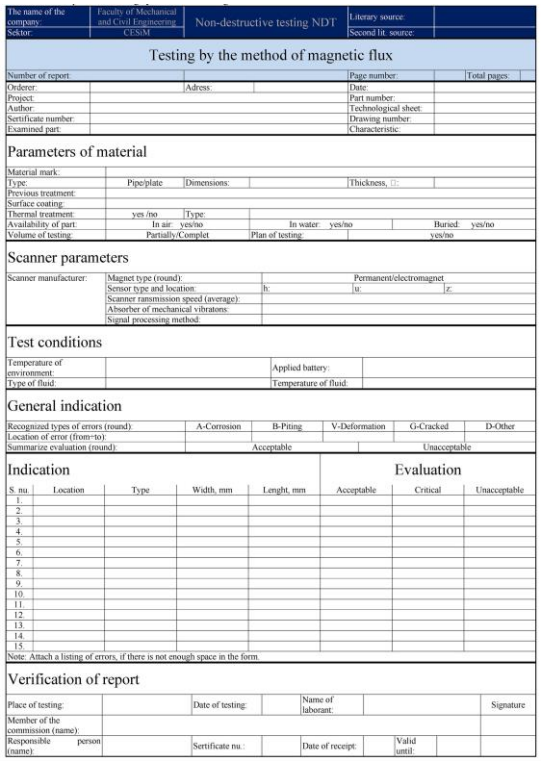
Description and location of indications

Level of acceptability of the test (round):	1	2	3

Verification of report

Place of testing:		Date of testing:		Name		Signature
Member of the commisson (name):						
Responsible person (name):		Sertificate number:		Date of receipt:	Valid until:	

Form 3. Test report from testing by the method of magnetic particles.



The name of the company:	Faculty of Mechanical and Civil Engineering	Non-destructive testing NDT	Literary source:	
Sektor:	CESiM		Second lit. source:	

Testing by the method of magnetic flux

Number of report:			Page number:	Total pages:
Orderer:		Adress:	Date:	
Project:			Part number:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	

Parameters of material

Material mark:					
Type:	Pipe/plate	Dimensions:		Thickness, □:	
Previous treatment:					
Surface coating:					
Thermal treatment:	yes /no	Type:			
Availability of part:	In air: yes/no		In water: yes/no		Buried: yes/no
Volume of testing:	Partially/Complet	Plan of testing:		yes/no	

Scanner parameters

Scanner manufacturer:	Magnet type (round):		Permanent/electromagnet
	Sensor type and location:	h:	u: z:
	Scanner ransmission speed (average):		
	Absorber of mechanical vibrations:		
	Signal processing method:		

Test conditions

Temperature of environment:		Applied battery:	
Type of fluid:		Temperature of fluid:	

General indication

Recognized types of errors (round):	A-Corrosion	B-Piting	V-Deformation	G-Cracked	D-Other
Location of error (from÷to):					
Summarize evaluation (round):	Acceptable		Unacceptable		

Indication					Evaluation		
S. nu.	Location	Type	Width, mm	Lenght, mm	Acceptable	Critical	Unacceptable
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

Note: Attach a listing of errors, if there is not enough space in the form.

Verification of report

Place of testing:		Date of testing:		Name of laborant:		Signature
Member of the commission (name):						
Responsible person (name):		Sertificate nu.:		Date of receipt:	Valid until:	

Form 4. Test report from testing by the method of magnetic flux.

The name of the company: | Faculty of Mechanical and Civil Engineering | Non-destructive testing NDT | Literary source:
Sektor: CESiM | Second lit. source:

Testing by radiography method (radiography/gamagraphy)

Report number: | Page number: | Total pages:
Orderer: | Adress: | Date:
Project: | Part:
Author: | Technological sheet:
Sertificate number: | Drawing number:
Examined part: | Characteristic:
Dimensions: | Type of joint: | Seam number: | Document:
Part number: | Group:
Base material: | Price: | Model nu.
Additional material: | Process of welding:
Previous treatment:
Condition of surface: Clean: yes/no | Oxides: yes/no | Coatings: yes/no | Technological sheet of welding:
Thermal treatment: yes /no | Type:
Previous treatment:
Warning about the test:
Volume of testing: | Plan of testing:

Radiography method

Type and manufacturer of defectoscope: a)Rontgenography | Voltage of pipe, V: | Anode current, kA: | Exposition:
b) Gamagraphy | Type of isotope: | Isotope mark: | Half-life period:
Parameters of process: Exposition: | f_{min} film-source, mm:
Type IKS: | R, level of recognition:
Way of deployment the film: | Manual/Automatic | N, quality index:
Deviations from standard procedures (report attachment): | yes/no

Test conditions

Temperature of environment: | Way of drying:
Temperature of sample: | Afterwards cleaning (medium):
Surface cleaner:

An integral part of the report are radiograms of the following specification

1. | 4.
2. | 5.

Image quality (IKS, ISO 1027)

Number of visible edge or openings	Smallest visible edge or opening d, mm	Quality index N	Level of recognition R, %	Smallest ľ na distancet f_{min}, mm	Number of visible edge or openings	Smallest visible edge or opening d, mm	Quality index N	Level of recognition R, %	Smallest i na distance f_{min}, mm
1.					4.				
2.					5.				

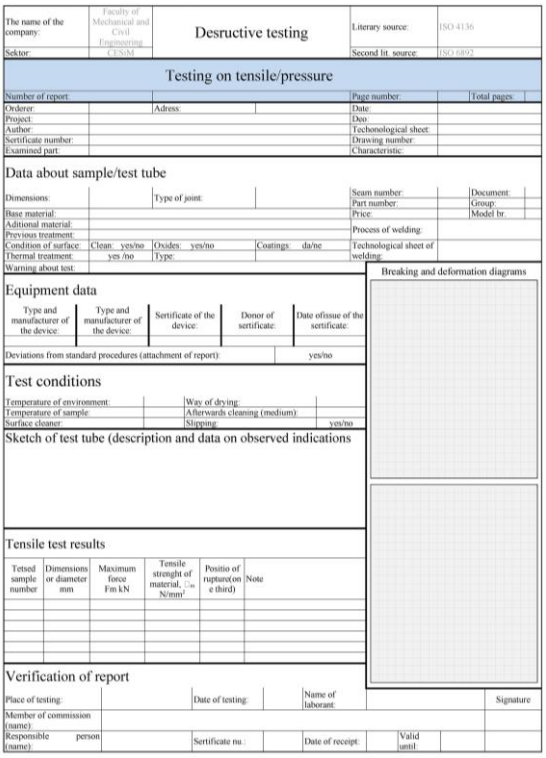
Description and location of indications

1. | 4.
2. | 5.

Verification of report

Place of testing: | Date of testing: | Name of laborant: | Signature
Member of the commission (name):
Responsible person (name): | Sertificate number: | Date of receipt: | Valid until:

Form 5. Test report from testing by radiography method.



The name of the company: | Faculty of Mechanical and Civil Engineering | Desructive testing | Literary source: ISO 4136
Sektor: CESiM | Second lit. source: ISO 6892

Testing on tensile/pressure

Number of report: | Adress: | Page number: | Total pages:
Orderer: | Date:
Project: | Deo:
Author: | Techonological sheet:
Sertificate number: | Drawing number:
Examined part: | Characteristic:

Data about sample/test tube

Dimensions: | Type of joint: | Seam number: | Document:
Part number: | Group:
Base material: | Price: | Model br.
Aditional material: | Process of welding:
Previous treatment:
Condition of surface: Clean: yes/no | Oxides: yes/no | Coatings: da/ne | Technological sheet of welding:
Thermal treatment: yes /no | Type:
Warning about test:

Breaking and deformation diagrams

Equipment data

Type and manufacturer of the device: | Type and manufacturer of the device: | Sertificate of the device: | Donor of sertificate: | Date ofissue of the sertificate:
Deviations from standard procedures (attachment of report): | yes/no

Test conditions

Temperature of environment: | Way of drying:
Temperature of sample: | Afterwards cleaning (medium):
Surface cleaner: | Slipping: | yes/no

Sketch of test tube (description and data on observed indications

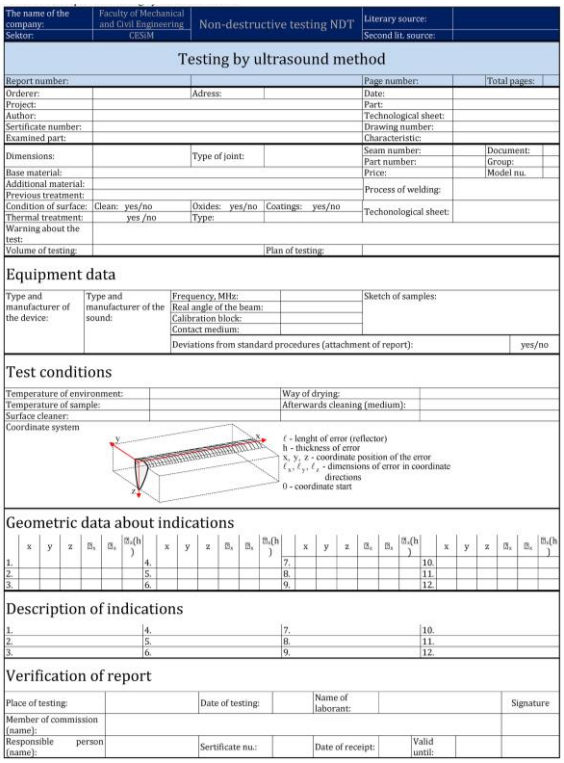
Tensile test results

Tetsed sample number	Dimensions or diameter mm	Maximum force Fm kN	Tensile strenght of material, σ_m N/mm^2	Positio of rupture(on e third)	Note

Verification of report

Place of testing: | Date of testing: | Name of laborant: | Signature
Member of commission (name):
Responsible person (name): | Sertificate nu.: | Date of receipt: | Valid until:

Form 7. Test report from testing by straining/pressure.



The name of the company: | Faculty of Mechanical and Civil Engineering | Non-destructive testing NDT | Literary source:
Sektor: CESiM | Second lit. source:

Testing by ultrasound method

Report number: | Page number: | Total pages:
Orderer: | Adress: | Date:
Project: | Part:
Author: | Technological sheet:
Sertificate number: | Drawing number:
Examined part: | Characteristic:
Dimensions: | Type of joint: | Seam number: | Document:
Part number: | Group:
Base material: | Price: | Model nu.
Additional material: | Process of welding:
Previous treatment:
Condition of surface: Clean: yes/no | Oxides: yes/no | Coatings: yes/no | Techonological sheet:
Thermal treatment: yes /no | Type:
Warning about the test:
Volume of testing: | Plan of testing:

Equipment data

Type and manufacturer of the device: | Type and manufacturer of the sound: | Frequency, MHz: | Real angle of the beam: | Calibration block: | Contact medium: | Sketch of samples:
Deviations from standard procedures (attachment of report): | yes/no

Test conditions

Temperature of environment: | Way of drying:
Temperature of sample: | Afterwards cleaning (medium):
Surface cleaner:
Coordinate system

ℓ - lenght of error (reflector)
h - thickness of error
x, y, z - coordinate position of the error
ℓ_x, ℓ_y, ℓ_z - dimensions of error in coordinate directions
0 - coordinate start

Geometric data about indications

	x	y	z	$\varnothing_x$	$\varnothing_z$	$\varnothing_x$(h)		x	y	z	$\varnothing_x$	$\varnothing_z$	$\varnothing_x$(h)		x	y	z	$\varnothing_x$	$\varnothing_z$	$\varnothing_x$(h)
1.							4.							7.							10.						
2.							5.							8.							11.						
3.							6.							9.							12.						

Description of indications

1. | 4. | 7. | 10.
2. | 5. | 8. | 11.
3. | 6. | 9. | 12.

Verification of report

Place of testing: | Date of testing: | Name of laborant: | Signature
Member of commission (name):
Responsible person (name): | Sertificate nu.: | Date of receipt: | Valid until:

Form 6. Test report from testing by ultrasound method.

The name of the company: | Faculty of Mechanical and Civil Engineering in Kraljevo | Desructive testing | Literary source: SRPS C.A4. 004
Sector: CESiM | Second lit. source:

Consumed energy of impact and/or impact toughness

Number of report: | Page number: | Total pages:
Ordered: | Address: | Date:
Project: | Part:
Author: | Technological sheet:
Sertificate number: | Drawing number:
Examined part: | Characteristic:

Sample data

Dimensions: | Type of joint: | Number of seam: | Document:
Part number: | Group:
Base material: | Price: | Model nu.
Additional material: | Process of welding:
Previous treatment:
Condition of surface: Clean: yes/no | Oxides: yes/no | Coatings: yes/no | Technological sheet of welding
Thermal treatment: yes /no | Type:
Test warning:

Terms of examination

Nominal pendulum energy, J: | 150, 300 | Enviroment temperature, °C:
Maximum pendulum speed, m/s: | Sample temperature, °C:

Equipment data

Type and device producer | Device Certificate : | Certificate holder: | Date of issue of the certificate:
Deviation from standard procedures (attachment report): | yes/no

Sketch of sample with the position and sketch of the test tube

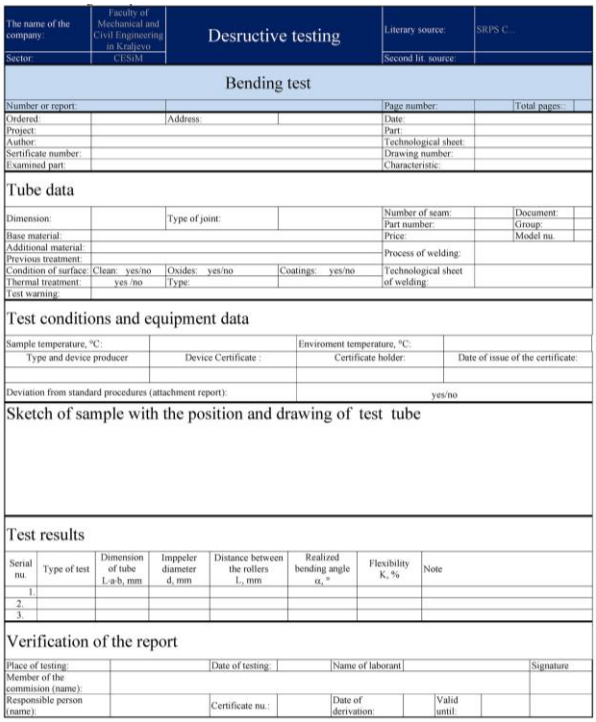
Hardness test results

Serial nu.	Label of consumed energy of impact U, J	Impact toughness, ρ, J/mm^2	Note
1.			
2.			
3.			
4.			
5.			

Verification of the report

Place of testing: | Date of testing: | Name of laborant | Signature
Member of the commision (name):
Responsible person (name): | Certificate nu.: | Date of derivation: | Valid until:

Form 8. Report from the study of consumed energy of impact or impact toughness.



The name of the company:	Faculty of Mechanical and Civil Engineering in Kraljevo	Desructive testing	Literary source:	SRPS C...
Sector:	CESiM		Second lit. source:	

Bending test

Number or report:			Page number:	Total pages:
Ordered:	Address:		Date:	
Project:			Part:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	

Tube data

Dimension:		Type of joint:		Number of seam:	Document:
				Part number:	Group:
Base material:				Price:	Model nu.
Additional material:				Process of welding:	
Previous treatment:					
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding:	
Thermal treatment:	yes /no	Type:			
Test warning:					

Test conditions and equipment data

Sample temperature, °C:		Enviroment temperature, °C:	
Type and device producer	Device Certificate :	Certificate holder:	Date of issue of the certificate:
Deviation from standard procedures (attachment report):		yes/no	

Sketch of sample with the position and drawing of test tube

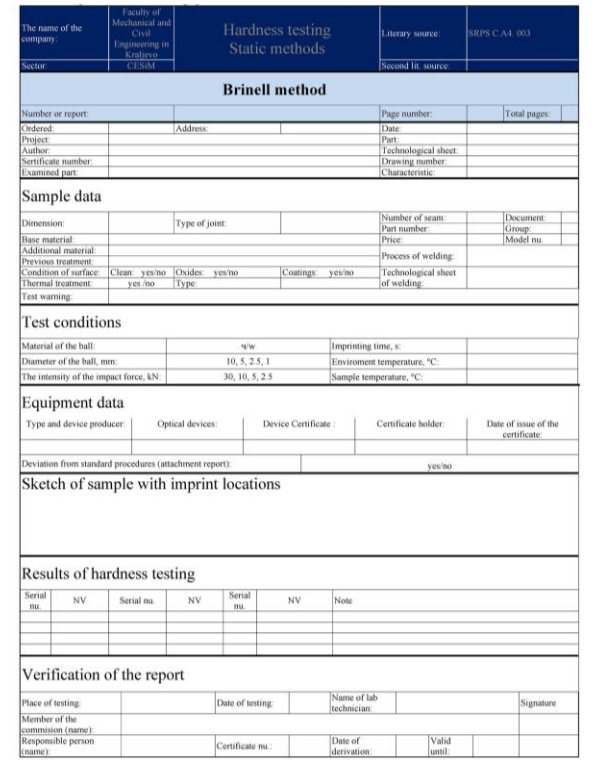
Test results

Serial nu.	Type of test	Dimension of tube L,a-b, mm	Imppeler diameter d, mm	Distance between the rollers L_1, mm	Realized bending angle α, °	Flexibility K, %	Note
1.							
2.							
3.							

Verification of the report

Place of testing:		Date of testing:		Name of laborant		Signature
Member of the commision (name):						
Responsible person (name):		Certificate nu.:		Date of derivation:	Valid until:	

Form 9. Bending test report.



The name of the company:	Faculty of Mechanical and Civil Engineering in Kraljevo	Hardness testing Static methods	Literary source:	SRPS C.A4. 003
Sector:	CESiM		Second lit. source:	

Brinell method

Number or report:			Page number:	Total pages:
Ordered:	Address:		Date:	
Project:			Part:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	

Sample data

Dimension:		Type of joint:		Number of seam:	Document:
				Part number:	Group:
Base material:				Price:	Model nu.
Additional material:				Process of welding:	
Previous treatment:					
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding:	
Thermal treatment:	yes /no	Type:			
Test warning:					

Test conditions

Material of the ball:	ч/w	Imprinting time, s:	
Diameter of the ball, mm:	10, 5, 2.5, 1	Enviroment temperature, °C:	
The intensity of the impact force, kN:	30, 10, 5, 2.5	Sample temperature, °C:	

Equipment data

Type and device producer:	Optical devices:	Device Certificate :	Certificate holder:	Date of issue of the certificate:
Deviation from standard procedures (attachment report):		yes/no		

Sketch of sample with imprint locations

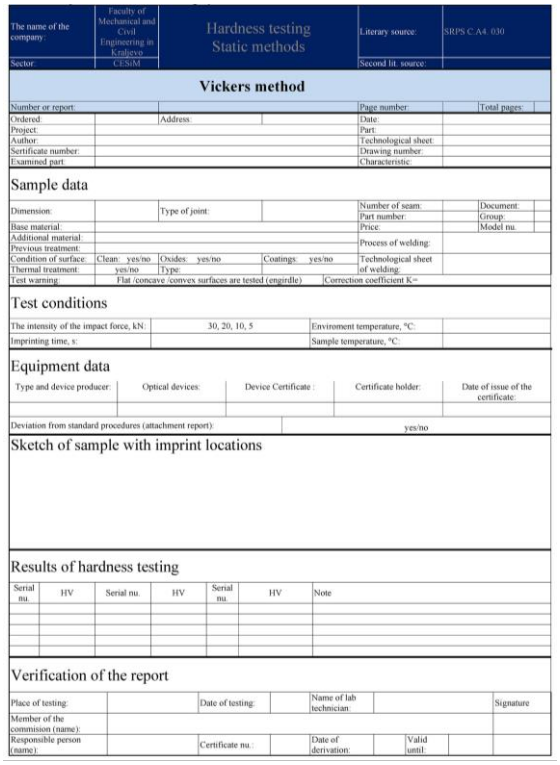
Results of hardness testing

Serial nu.	NV	Serial nu.	NV	Serial nu.	NV	Note

Verification of the report

Place of testing:		Date of testing:		Name of lab technician:		Signature
Member of the commision (name):						
Responsible person (name):		Certificate nu.:		Date of derivation:	Valid until:	

Form 10. Report from hardness testing by Brinell method.



The name of the company:	Faculty of Mechanical and Civil Engineering in Kraljevo	Hardness testing Static methods	Literary source:	SRPS C.A4. 030
Sector:	CESiM		Second lit. source:	

Vickers method

Number or report:			Page number:	Total pages:
Ordered:	Address:		Date:	
Project:			Part:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	

Sample data

Dimension:		Type of joint:		Number of seam:	Document:
				Part number:	Group:
Base material:				Price:	Model nu.
Additional material:				Process of welding:	
Previous treatment:					
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding:	
Thermal treatment:	yes/no	Type:			
Test warning:	Flat /concave /convex surfaces are tested (engirdle)			Correction coefficient K=	

Test conditions

The intensity of the impact force, kN:	30, 20, 10, 5	Enviroment temperature, °C:	
Imprinting time, s:		Sample temperature, °C:	

Equipment data

Type and device producer:	Optical devices:	Device Certificate :	Certificate holder:	Date of issue of the certificate:
Deviation from standard procedures (attachment report):		yes/no		

Sketch of sample with imprint locations

Results of hardness testing

Serial nu.	HV	Serial nu.	HV	Serial nu.	HV	Note

Verification of the report

Place of testing:		Date of testing:		Name of lab technician:		Signature
Member of the commision (name):						
Responsible person (name):		Certificate nu.:		Date of derivation:	Valid until:	

Form 11. Report from hardness testing by Vickers method.

The name of the company:	Faculty of Mechanical and Civil Engineering in Kraljevo	Hardness testing Static methods	Literary source:	SRPS C.A4. 030
Sector:	CESiM		Second lit. source:	

Rockwell method B or C (engrid)

Number or report:			Page number:	Total pages:
Ordered:	Address:		Date:	
Project:			Part:	
Author:			Technological sheet:	
Sertificate number:			Drawing number:	
Examined part:			Characteristic:	

Sample data

Dimension:		Type of joint:		Number of seam:	Document:
				Part number:	Group:
Base material:				Price:	Model nu.
Additional material:				Process of welding	
Previous treatment:					
Condition of surface:	Clean: yes/no	Oxides: yes/no	Coatings: yes/no	Technological sheet of welding:	
Thermal treatment:	yes /no	Type:			
Test warning:	Flat /concave /convex surfaces are tested (engirdle)			Correction coefficient K=	

Test conditions

	Method	Initial F_0	Main F_1	Total F	Time of the full load operation, s:	
The intensity of the impact force, kN:	B	98.07	1373	1471	Enviroment temperature, °C:	
	C	98.07	882.6	980.7	Sample temperature, °C:	

Equipment data

Type and device producer:	Optical devices:	Device Certificate :	Certificate holder:	Date of issue of the certificate:
Deviation from standard procedures (attachment report):		yes/no		

Sketch of sample with imprint locations

Results of hardness testing

Serial nu.	HR__	Serial nu.	HR__	Serial nu.	HR__	Note (on the dash should be entered method label)

Verification of the report

Place of testing:		Date of testing:		Name of lab technician:		Signature
Member of the commision (name):						
Responsible person (name):		Certificate nu.:		Date of derivation:	Valid until:	

Form 12. Report from hardness testing by Rockwell method